

# ALTERNATIVE FUEL VEHICLE INCENTIVES AND LAWS

## Why alternative fuels?

Nowhere else in the world is the value of the automobile and the importance of transportation more recognized than it is right here in the United States. The transportation sector has an enormous impact on our economy, our nation's energy security, and our environment. Every year we increase our dependence on imported oil -- which increases the trade deficit, costs us jobs, and undermines our national security. Moreover, emissions from vehicles are the single largest contributor to air pollution in many cities -- making our air unhealthy to breathe and increasing our health care costs. We can change this situation. Expanding utilization of alternative fuels offers solutions to many of these problems. The plan is Clean Cities.

## What is Clean Cities?

Clean Cities is a *locally-based* government/industry partnership, coordinated by the U.S. Department of Energy (DOE) to expand the use of alternatives to gasoline and diesel fuel. By combining local decision-making with voluntary action by *partners*, the "grass-roots" approach of Clean Cities departs from traditional "top-down" federal programs. It creates an effective plan, carried out at the local level, for creating a sustainable, nationwide alternative fuels market.

## How does Clean Cities work?

Clean Cities builds on local initiative, provides options to local problems, and creates partnerships as the mechanism to develop solutions. Clean Cities works directly with local businesses and governments to shepherd them through the goal-setting, coalition-building, and commitments process necessary to establish the foundations for a viable alternative fuels market. Then, by sharing local innovation along the Clean Cities network "mayor-to-mayor," by relating local problems to state and federal objectives, and by providing continuous feedback to the 1,200+ industry and government stakeholders, Clean Cities can continually pioneer innovations and aspire to effect national as well as local achievements. DOE will be working with Clean Cities coalitions nationwide to:

- **Create new jobs and commercial opportunities** - Alternative fuels and alternative fuel vehicles (AFVs) can benefit the economy in many ways. Converting conventional vehicles to AFVs, developing new technologies and products, utilizing domestically-produced alternative fuels, increasing crop (feedstock) production, and expanding alternative fuel infrastructure create commercial opportunities, new jobs, and businesses nationwide.
- **Facilitate alternative fuel vehicle production and conversion** - By pledging AFV acquisitions through the year 2005, the 1,200+ registered Clean Cities stakeholders have shown that significant demand exists for these vehicles. Clean Cities will work to transform these pledges into validated vehicle acquisition and conversion plans useful to manufacturers challenged to develop market-driven production lines.
- **Advance Clean Air objectives** - The Clean Cities program will advance the objectives of the Clean Air Act and seek to integrate its 1990 Amendments into each Clean City coalition's decision-making process.
- **Increase public awareness** - Clean Cities will pursue an active public education campaign to ensure that citizens are aware of the benefits of using alternative fuels over gasoline and diesel.
- **Provide greater fuel choices** - The variety of fuel choices has enabled Clean Cities to choose the alternative fuels that best serve their local community and economy. This choice gives the community an opportunity to utilize the fuels which provide them with the best fuel performance, reduced emissions, and financial incentives.
- **Develop "Clean Corridors"** - Clean Cities recognizes the need for "clean corridors" and will build links between existing Clean Cities to ensure that refueling facilities will be available for regional transit.

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### *How does Clean Cities work? (cont.)*

- **Expand refueling infrastructure** - Concurrent with Clean Cities expansion of the AFV market, the program will build on fuel supplier commitments to provide the refueling infrastructure critical for service and maintenance of AFVs. In addition, the program will seek to make available existing private refueling stations for wider use.
- **Support regulated fleets** - Through the Clean Cities program, DOE will be able to provide local assistance to Federal and state requirements for AFV acquisitions and conversions.

### *Where do I get more information?*

The Clean Cities Hotline (toll-free (800) CCITIES) provides answers to questions on funding, alternative fuel and AFV questions, program planning, and other program issues. The Hotline also makes available several resources for Clean Cities use, including the following publications:

- *The Road to Clean Cities* provides cities with step-by-step instructions on how to become a Clean City.
- *Clean Cities Troubleshooting Guide* offers helpful suggestions on solving the challenges Clean Cities may face.
- Clean Cities newsletter, *The Drive*, provides cities with quarterly updates on the Clean Cities program.

DOE has also appointed Clean Cities program managers at each of the DOE Regional Support Offices to assist local Clean Cities with their alternative fuels market development. In addition, the vast network of local Clean Cities coordinators is available to share information and provide assistance. The names and phone numbers of the Clean Cities coordinators and the Clean Cities program managers at the DOE Regional Support Offices are listed in this document, under the appropriate state's Points of Contact section.

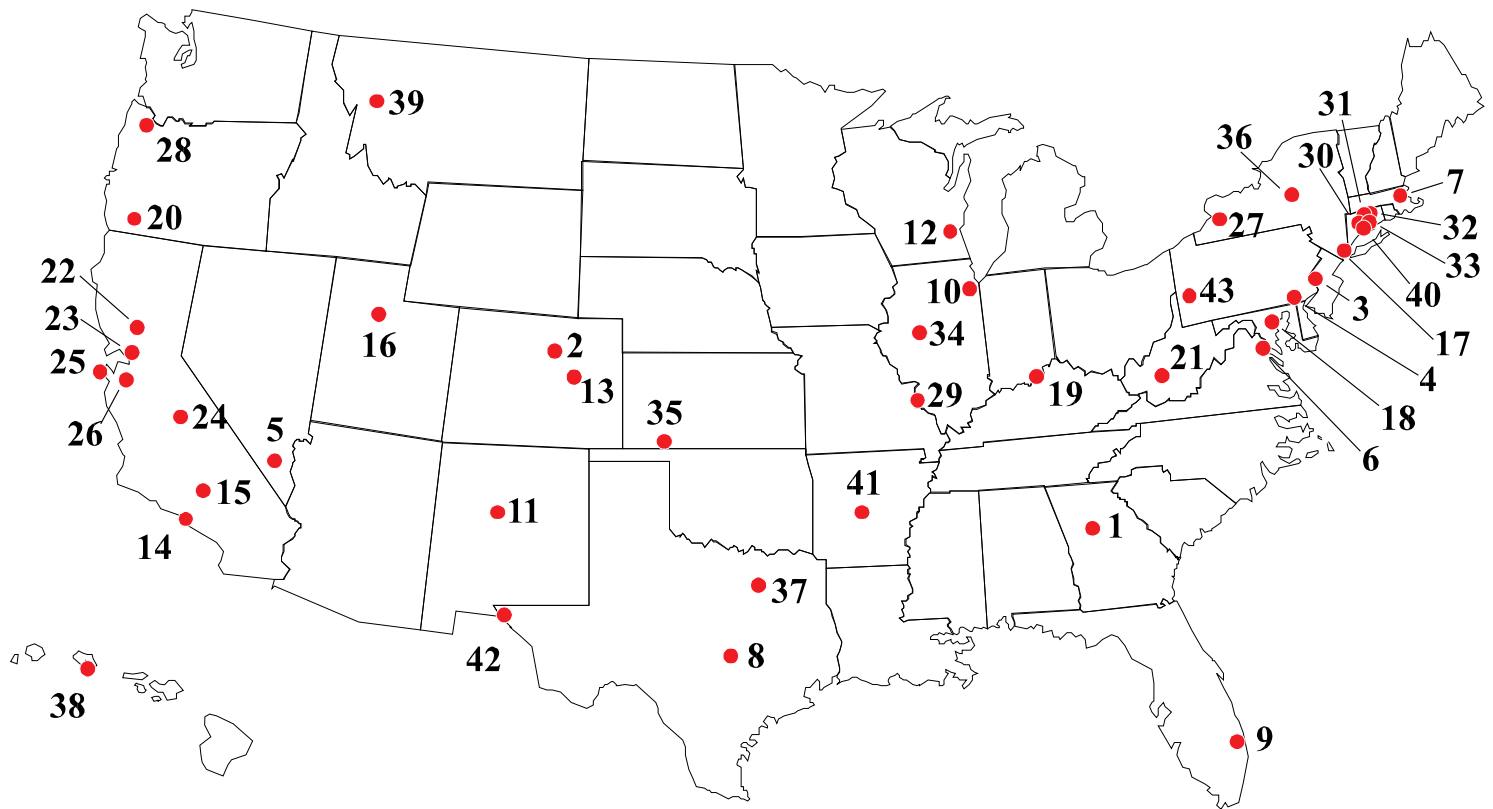
To obtain more information, contact the Clean Cities Hotline at (800) CCITIES, or write to: U.S. Department of Energy, EE-33, Clean Cities Program, 1000 Independence Avenue SW, Washington, DC 20585. Visit the Clean Cities Home Page on the Internet. The Clean Cities Home Page can be accessed through the Energy Efficiency and Renewable Energy Network at:

- [www.eren.doe.gov/transportation/transportation.html](http://www.eren.doe.gov/transportation/transportation.html)



Throughout this guide, states with one or more designated Clean Cities are indicated by this Clean Cities symbol.

# DESIGNATED CLEAN CITIES – DESIGNATION DATES



- |                                    |   |                                    |
|------------------------------------|---|------------------------------------|
| 1. ATLANTA, GA – 9/8/93            | 16. SALT LAKE CITY, UT – 10/3/94        | 31. WATERBURY, CT – 11/21/94       |
| 2. DENVER, CO – 9/13/93            | 17. WHITE PLAINS, NY – 10/4/94          | 32. NORWICH, CT – 11/22/94         |
| 3. PHILADELPHIA, PA – 9/22/93      | 18. BALTIMORE, MD – 10/7/94             | 33. NEW LONDON, CT – 11/22/94      |
| 4. WILMINGTON, DE – 10/12/93       | 19. LOUISVILLE, KY – 10/18/94           | 34. PEORIA, IL – 11/22/94          |
| 5. LAS VEGAS, NV – 10/18/93        | 20. ROUGUE VALLEY, OR – 10/18/94        | 35. KANSAS, SW AREA – 3/30/95      |
| 6. WASHINGTON, DC – 10/21/93       | 21. STATE OF WV – 10/19/94              | 36. CENTRAL NEW YORK – 6/15/95     |
| 7. BOSTON, MA – 3/18/94            | 22. SACRAMENTO, CA – 10/21/94           | 37. DALLAS/FT. WORTH, TX – 7/25/95 |
| 8. AUSTIN, TX – 4/18/94            | 23. OAKLAND, CA – 10/21/94              | 38. HONOLULU, HI – 8/29/95         |
| 9. FLORIDA GOLD COAST – 5/3/94     | 24. SAN JOAQUIN VALLEY, CA – 10/21/94   | 39. MISSOULA, MT – 9/21/95         |
| 10. CHICAGO, IL – 5/13/94          | 25. SAN FRANCISCO, CA – 10/21/94        | 40. NEW HAVEN, CT – 10/5/95        |
| 11. ALBUQUERQUE, NM – 6/1/94       | 26. SOUTH BAY (SAN JOSE), CA – 10/21/94 | 41. CENTRAL ARKANSAS – 10/25/95    |
| 12. WISCONSIN, SE AREA – 6/30/94   | 27. WESTERN NEW YORK – 11/4/94          | 42. PASEO DEL NORTE – 11/17/95     |
| 13. COLORADO SPRINGS, CO – 7/13/94 | 28. PORTLAND, ME – 11/10/94             | 43. PITTSBURGH, PA – 12/5/95       |
| 14. LONG BEACH, CA – 8/31/94       | 39. ST. LOUIS, MO – 11/18/94            |                                    |
| 15. LANCASTER, CA – 9/22/94        | 30. NORWALK, CT – 11/21/94              |                                    |

# ALTERNATIVE FUEL VEHICLE INCENTIVES AND LAWS

## *Introduction*

Funding is a central issue in any effort to use alternative fuel vehicles (AFVs). Incentives are very important, especially as they help to defray the incrementally higher costs of acquiring AFVs. However, the wide variety and types of incentives can be confusing and has led the Clean Cities program to step in and help sort things out. This *Guide to Alternative Fuel Vehicle Incentives and Laws* contains a listing of state, Federal, and private incentives offered to encourage the expanded use of AFVs. Of these incentives, private sources of funding are becoming more important as partners are recognizing the commercial value of the growing market. We have tried to include with each incentive a contact name and phone number for you to follow-up and get more details on the programs that apply to you. However, if no one answers when you call, or if you have any trouble getting the answers you need, call the Clean Cities Hotline at (800) CCITIES.

This is the first edition of this guide. It is the result of months of research and hundreds of phone calls. The information in this guide is current as of November 17, 1995. Programs and laws are constantly changing, but the best efforts have been put forth to produce a comprehensive, and up-to-date guide to AFV incentives. Consequently this document is to be viewed as the first in a series. If your organization is not listed, or if the information on your organization's programs has changed, please call TG Powell, Clean Cities Consultant, Abacus Technology Corporation, at (301) 951-1717, so that corrections can be made for the next edition.

Applying incentives to purchases of AFVs can be like clipping coupons. Think of this guide as a coupon book that shows what discounts and incentives can be applied to your purchases. The incentives can be grouped together to significantly defray the final purchase price of an AFV. Since most incentives are only available in certain states or areas, and many of the private company incentives apply only to people in that company's service area, you may need to call to confirm your eligibility for some of the rebates or programs. This is why we have included points of contact for each listing.

## *Alternative Fuel Vehicle Incentives Worksheet*

Clean Cities realizes that most of you do not have the time to search for funding opportunities. Therefore, this guide identifies available funding opportunities and presents the information clearly and concisely. We have made every effort to replace wordy descriptions with **\$ signs and numbers**, because this funding guide is all about saving you money. To take this idea of **\$ signs and numbers** one step further, we have created an easy-to-use worksheet so that you can calculate a cumulative AFV funding potential. Examples of completed worksheets are included in this guide as well as a blank worksheet for you to calculate your potential savings. An additional perforated blank worksheet can be found at the end of the book.

The worksheet is composed of two parts. The first part includes a section for tabulating various potential sources of funding. The second part of the funding worksheet allows you to calculate the individual payback periods for your AFV purchases.

### ***Completing Part 1 of the Worksheet***

To complete the first part of the worksheet on sources of funding, please turn to your state's section of this book. To help identify incentives with dollar values, we have highlighted in **green** those incentives that can be plugged into the worksheet. Look at the AFV funding opportunities in your state and insert into the worksheet those incentives for which you are eligible. In addition, read through your state's section to see if there are any other possible sources of funding. You may need to make some phone calls to get the details on some programs.

Part 1 of the worksheet, Sources of Funding, is divided into four headings: I. State Incentives, II. Utilities/Private Incentives, III. State Laws & Regulations, and IV. Federal Tax Incentives. Headings I - III correspond to headings under each state section. Heading IV corresponds to the Federal section of the book, starting on page 128.

- I. State Incentives** - If any state incentives apply to you, fill in the name of the programs on the lines, and enter the total dollar amount in the corresponding box under the "Amount You Expect to Receive" column.
- II. Utilities/Private Incentives** - If your local utility has an incentive program listed, you can insert that into the worksheet here. You may want to call the contact person listed to get the details on the program. In addition to what is listed, many local utility companies will work with customers on a case-by-case basis to provide custom incentives for AFVs. Call the local utility in your area for details. Some alternative fuel providers that are not utilities offer incentives for AFVs. In addition, when purchasing a new vehicle, check with the manufacturer for any rebates.
- III. State Laws & Regulations** - Some state laws and regulations can provide savings for AFVs. For instance, several states offer sales tax exemptions for AFV purchases. If your state offers this exemption, you could figure out how much tax you would have had to pay and enter that amount in the worksheet. If the fuel tax in your state is lower on your alternative fuel of choice than on gasoline, you could calculate your fuel tax savings by multiplying the difference between the gasoline fuel tax and the alternative fuel tax by the vehicle's miles per gallon (mpg) to find the dollars per mile fuel tax savings. Then multiply the dollars per mile fuel tax savings by the annual driving distance you expect for your vehicle to find the fuel tax savings for the first year. Again, enter the total amount in the corresponding box.
- IV. Federal Tax Incentives** - The Federal tax incentives on page 128 can be plugged right into the worksheet. For electric vehicles, the tax credit of 10% of the vehicle cost, up to \$4,000 can be entered directly in the corresponding box under numeral IV. For other AFVs, the value of the tax deduction will depend on your tax rate. To find the dollar value of the tax deduction, multiply the amount of the deduction by your tax rate. For example, if you were purchasing an AFV that qualified for the \$2,000 tax deduction, and your income level put you in the 28% tax bracket, the value of the tax deduction would be \$560. Check with your tax advisor for the details of how the Federal tax incentives would apply to your specific situation, or call the Internal Revenue contact person listed with the Federal tax incentives on page 128.

Once you have identified all the incentives that apply to you, simply add them up to see your potential savings, and enter the total in the box labeled **Total Funding**.

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### Completing Part 2 of the Worksheet

Part 2 of the worksheet involves determining the payback period for your AFV. To calculate the payback period, follow these step-by-step instructions.

1. Determine the **Incremental Cost** for your vehicle by subtracting the cost of a comparable gasoline vehicle from the initial cost of your AFV. For converting existing vehicles, use the conversion cost as the **Incremental Cost**.
2. Subtract the **Total Funding** that you calculated in **Part 1** from the Incremental Cost (1a). This will give you the **Net Incremental Cost** (2a) of the AFV. If the **Net Incremental Cost** is less than zero, then your incentives offset the incremental cost for the AFV. You do not need to continue to figure your payback period, because you do not have any additional costs to pay back. For most people, the incentives will not be enough to cover the additional incremental costs of the AFV. However, if it costs you less to run your vehicle on the alternative fuel than it would to run it on gasoline, then you can use steps 3 through 5 to determine how many miles you will need to drive the vehicle to save enough in fuel costs to pay back the **Net Incremental Cost** of the AFV.
3. Determine your fuel costs per mile for using both the alternative fuel and gasoline. Complete section 3a below, and then complete one of the two remaining sections, 3b or 3c, depending on the type of fuel for your AFV.
  - a) For gasoline, divide the per gallon price of gasoline by the vehicle's miles per gallon (mpg). For example, if the average price in your city for a gallon of gasoline is \$1.20, write \$1.20 in the box labeled "\$ per gallon." If your vehicle gets 20 miles per gallon, write 20 in the box labeled "vehicle mpg." Then divide \$1.20 by 20 to get \$0.06 per mile fuel cost.
  - b) For the alternative fuel, divide the price per gasoline gallon equivalent (gge) by the vehicle's mpg when operating on the alternative fuel. If you are buying a new vehicle, the manufacturer can provide you with this number. If you are converting a vehicle, the conversion company can provide you with an estimate of the mpg. For example, if you are converting to a natural gas vehicle (NGV), and natural gas will cost you \$0.75 per gge, write \$0.75 in the box labeled "\$ per gge." If the vehicle, once converted to natural gas will get 20 miles per gge, write 20 in the box labeled "vehicle mpg." Then divide \$0.75 by 20 to get \$0.0375 per mile fuel cost.
  - c) For an electric vehicle, divide the price of electricity per kilowatt hour (kWh), by the miles the vehicle will get per kWh. The manufacturer or conversion company will be able to give you this figure. For example, if your electric rate is \$0.041 per kWh, write \$0.041 in the box labeled "\$ per kWh." If the vehicle will get 4 miles per kWh, enter 4 in the box labeled "vehicle miles per kWh." Then divide \$0.041 by 4 to get \$0.01025 per mile fuel cost.
4. Find your **\$ savings per mile** by subtracting the per mile fuel cost of the alternative fuel (box 3b or 3c) from the per mile gasoline cost (box 3a). For example, for the NGV shown above in 3b, subtract \$0.0375 per mile fuel cost from \$0.06 per mile gasoline cost in 3a to get a cost savings of \$0.0225 per mile.
5. To find the **Payback Period**, divide the **Net Incremental Cost** (box 2a) by the **\$ savings per mile** (box 4a) to get the payback period in miles. This calculates the number of miles the vehicle would need to be driven to pay back the additional incremental cost of the AFV.

# ALTERNATIVE FUEL VEHICLE INCENTIVES AND LAWS

## AFV FUNDING WORKSHEET -- State of \_\_\_\_\_

### PART 1 - Sources of Funding

#### I. State Incentives


#### II. Utilities/Private Incentives


#### III. State Laws & Regulations


#### IV. Federal Tax Incentives


### Amount You Expect to Receive

\$ 

+ \$ 

+ \$ 

+ \$ 

Total Funding = \$

### PART 2 - Payback Period

1) To calculate an AFV's payback period, you first need to know the **Incremental Cost** of that vehicle compared to a comparable gasoline vehicle:

$$\begin{array}{ccccc} \$ & \boxed{\phantom{000000}} & - \$ & \boxed{\phantom{000000}} & = \$ \boxed{\phantom{000000}} & 1a \\ & \text{Initial Cost of AFV} & & \text{Cost of Comparable Gasoline Vehicle} & & \text{Incremental Cost *} \end{array}$$

\* NOTE: If you are converting existing fleet vehicles, then substitute the conversion cost for the **Incremental Cost**.

2) Subtract from the **Incremental Cost**, box 1a, the **Total Funding** from the box at bottom of Part 1 to get the **Net Incremental Cost**.

$$\begin{array}{ccccc} \$ & \boxed{\phantom{000000}} & - \$ & \boxed{\phantom{000000}} & = \$ \boxed{\phantom{000000}} & 2a \\ & \text{Incremental Cost (from box 1a)} & & \text{Total Funding (from part 1)} & & \text{Net Incremental Cost} \end{array}$$

3) To find the **\$ per mile fuel cost**, divide your fuel cost per gasoline gallon equivalent (gge) by your vehicle's miles per gallon (mpg). Do this calculation for both gasoline and the alternative fuel.

a) gasoline:

$$\begin{array}{ccccc} \$ & \boxed{\phantom{000000}} & / & \boxed{\phantom{000000}} \text{ mpg} & = \$ \boxed{\phantom{000000}} & 3a \\ & \$ \text{ per gallon} & & \text{vehicle mpg} & & \$ \text{ per mile fuel cost} \end{array}$$

b) alternative fuel:

$$\begin{array}{ccccc} \$ & \boxed{\phantom{000000}} & / & \boxed{\phantom{000000}} \text{ mpg} & = \$ \boxed{\phantom{000000}} & 3b \\ & \$ \text{ per gge} & & \text{vehicle mpg} & & \$ \text{ per mile fuel cost} \end{array}$$

c) electric:

$$\begin{array}{ccccc} \$ & \boxed{\phantom{000000}} & / & \boxed{\phantom{000000}} \text{ mi/kWh} & = \$ \boxed{\phantom{000000}} & 3c \\ & \$ \text{ per kWh} & & \text{vehicle miles per kWh} & & \$ \text{ per mile fuel cost} \end{array}$$

4) Then subtract the **\$ per mile fuel cost** of your alternative fuel from the **\$ per mile fuel cost** of gasoline to find your **\$ savings per mile**.

$$\begin{array}{ccccc} \$ & \boxed{\phantom{000000}} & - \$ & \boxed{\phantom{000000}} & = \$ \boxed{\phantom{000000}} & 4a \\ & \$ \text{ per mile fuel cost gasoline (from box 3a)} & & \$ \text{ per mile fuel cost alternative fuel (from box 3b or 3c)} & & \$ \text{ savings per mile} \end{array}$$

5) Then divide the **Net Incremental Cost**, box 2a, by the **\$ savings per mile**, box 4a, to get the payback period for your AFV in terms of miles.

$$\begin{array}{ccccc} \$ & \boxed{\phantom{000000}} & / \$ & \boxed{\phantom{000000}} & = \boxed{\phantom{000000}} & \text{miles} \\ & \text{Net Incremental Cost (from box 2a)} & & \$ \text{ savings per mile (from box 4a)} & & \text{Payback in miles} \end{array}$$

## ALTERNATIVE FUEL VEHICLE INCENTIVES AND LAWS

### Examples of Completed Worksheets

#### Example 1

Example 1 is the completed worksheet for the purchase of a new OEM CNG vehicle in Pennsylvania (see page 9). Suppose you live in Pennsylvania and are interested in purchasing a new CNG Chrysler Ram Van. In this example, the cost of the vehicle is \$20,556, the cost of a comparable gasoline vehicle is \$15,493, the vehicle gets 18 miles to the gallon on either gasoline or CNG, gasoline costs are \$1.20 per gallon, and CNG costs are \$0.75 per gasoline gallon equivalent (gge).

On page 96 you find, in the **green highlights box**, that the State Energy Office's Incentive Grants program will pay for 50% of the incremental costs for the natural gas option on your vehicle. Since the incremental cost for the natural gas option for the vehicle is \$5,063, the Alternative Fuel Incentive Grants (AFIG) program will pay 50% or \$2,531.50. The AFIG program is put under the **State Incentives** heading in **Part 1** of the worksheet, with the amount of \$2,531.50 in the box in the **Amount You Expect to Receive** column. On pages 96 and 97 you see that if you live in the service area of Consolidated Natural Gas Company, you can receive a \$1,000 rebate on the purchase of an OEM AFV. Assuming that Consolidated Natural Gas is your local gas utility, the rebate is put under the **Utilities/Private Incentives** heading in Part 1 of the worksheet, with the amount \$1,000 in the box in the **Amount You Expect to Receive** column. The details on the programs in the highlights section for each state are printed in **green** with a \$ next to them to make it easier for you to find the information you need. The text for each state also includes additional information on other AFV programs in the state.

For the **Federal Tax Incentives** heading, turn to page 128. The CNG van qualifies for a \$2,000 tax deduction. If you are in the 28% tax bracket, the value of the tax deduction would be \$560. The \$2,000 Federal tax deduction is put under the **Federal Tax Incentives** heading in **Part 1** of the worksheet, with the amount of \$560 in the box in the **Amount You Expect to Receive** column. Add together all of the numbers in the **Amount You Expect to Receive** column to get a **Total Funding** amount of \$4,091.50.

**Part 2** of the worksheet calculates the payback period. In step 1, subtract the \$15,493 cost of a comparable gasoline vehicle from the \$20,556 cost for the NGV to get the **Incremental Cost** of \$5,063. In step 2, subtract the **Total Funding** of \$4,091.50 from the **Incremental Cost** of \$5,063 to get \$971.50 as your **Net Incremental Cost** after applying incentives. In step 3a, divide the price of \$1.20 per gallon for gasoline by the vehicle fuel efficiency of 18 mpg, to get \$0.0667 per mile fuel cost. In step 3b, divide \$0.75 per gge cost of CNG by the vehicle fuel efficiency of 18 mpg to get \$0.0417 per mile fuel cost. In step 4, subtract the \$0.0417 per mile fuel cost (box 3b) from the \$0.0667 per mile gasoline cost (box 3a) to get a cost savings of \$0.025 per mile. In step 5, divide the **Net Incremental Cost** of \$971.50 (box 2a) by the fuel cost **\$ savings per mile** of \$0.025 (box 4a) to get 38,860 miles as the payback period. The vehicle would need to be driven 38,860 miles to pay back the additional incremental cost of the AFV.

#### Example 2

Example 2 is a completed worksheet for a CNG conversion in Kansas (see page 10). The amounts for the incentives for Kansas can be found on page 52. The worksheet uses a conversion cost of \$4,000. The green highlights box on page 58 shows that Kansas offers a tax credit for 50% of the conversion cost for AFVs. With a conversion cost of \$4,000, the 50% tax credit would be worth \$2,000. On page 51, you see that the Kansas Corporation Commission offers a \$1,500 incentive for AFVs. Add together the \$2,000 tax credit and the \$1,500 incentive to get a total of \$3,500 for the **State Incentives** heading in **Part 1** of the worksheet, and enter the amount of \$3,500 in the box in the **Amount You Expect to Receive** column. Then figure out value of the Federal tax deduction as shown in Example 1. The \$2,000 Federal tax deduction is put under the **Federal Tax Incentives** heading in Part 1 of the worksheet, with the amount of \$560 in the box in the **Amount You Expect to Receive** column. Add together all of the numbers in the **Amount You Expect to Receive** column to get a **Total Funding** amount of \$4,060. In this case, the **Total Funding** of \$4,060 completely covers the incremental cost of the conversion, so there is no need to complete **Part 2** of the worksheet.

#### Example 3

Example 3 is a completed worksheet for the purchase of an EV in California (see page 11). The incentives for California are on page 21. The worksheet assumes that the EV cost is \$32,000, and the cost of a comparable gasoline vehicle is \$20,000. A \$5,000 incentive for EV purchases is available from the South Coast Air Quality District. The Federal Tax Credit for EVs is based on 10% of the vehicle cost, up to \$4,000. For the vehicle in the worksheet, the credit would be 10% of \$32,000 or \$3,200. Add these two incentives to get a **Total Funding** amount of \$8,200. **Part 2** assumes a cost for gasoline of \$1.20 per gallon, and a cost of electricity of \$0.041 per kWh, and an EV fuel efficiency of 4 miles per kWh. Using these figures, the payback period for the EV would be 76,381 miles.

**NOTE:** These examples are provided to give you an idea of how to use the worksheets. Your individual situation may be different, even if you live in the same state used in one of the examples. Be sure to call to confirm the details of incentives that apply to you.



# ALTERNATIVE FUEL VEHICLE INCENTIVES AND LAWS

## EXAMPLE 1 AFV FUNDING WORKSHEET -- Pennsylvania - Natural Gas Vehicle Purchase

### PART 1 - Sources of Funding

- I. State Incentives  
AFIG pays 50% of incremental costs on dedicated NGVs; (see page 95)  
\$26,500 - \$20,000 = \$6,500 incremental cost  
\$6,500 \* 0.50 = \$3,250
- II. Utilities/Private Incentives  
\$1,000 rebate from Consolidated Natural Gas  
(see page 95)
- III. State Laws & Regulations
- IV. Federal Tax Incentives  
\$2,000 tax deduction (see page 128)  
\* \$2,000 \* 0.28 = \$560  
(28% tax bracket)

### Amount You Expect to Receive

\$ 2,531.50

+ \$ 1,000

+ \$ 0

+ \$ 560

Total Funding = \$ 4,091.50

### PART 2 - Payback Period

1) To calculate an AFV's payback period, you first need to know the **Incremental Cost** of that vehicle compared to a comparable gasoline vehicle:

$$\begin{array}{rcccl} \$ & \boxed{20,556} & - & \$ \boxed{15,493} & = & \$ \boxed{5,063} & 1a \\ & \text{Initial Cost of AFV} & & \text{Cost of Comparable Gasoline Vehicle} & & \text{Incremental Cost *} \end{array}$$

\* NOTE: If you are converting existing fleet vehicles, then substitute the conversion cost for the **Incremental Cost**.

2) Subtract from the **Incremental Cost**, box 1a, the **Total Funding** from the box at the bottom of Part 1 to get the **Net Incremental Cost**.

$$\begin{array}{rcccl} \$ & \boxed{5,063} & - & \$ \boxed{4,091.50} & = & \$ \boxed{971.50} & 2a \\ & \text{Incremental Cost (from box 1a)} & & \text{Total Funding (from part 1)} & & \text{Net Incremental Cost} \end{array}$$

3) To find the **\$ per mile fuel cost**, divide your fuel cost per gasoline gallon equivalent (gge) by your vehicle's miles per gallon (mpg). Do this calculation for both gasoline and the alternative fuel.

a) gasoline:

$$\begin{array}{rcccl} \$ & \boxed{1.20} & / & \boxed{18} \text{ mpg} & = & \$ \boxed{0.0667} & 3a \\ & \$ \text{ per gallon} & & \text{vehicle mpg} & & \$ \text{ per mile fuel cost} \end{array}$$

b) alternative fuel:

$$\begin{array}{rcccl} \$ & \boxed{0.75} & / & \boxed{18} \text{ mpg} & = & \$ \boxed{0.0417} & 3b \\ & \$ \text{ per gge} & & \text{vehicle mpg} & & \$ \text{ per mile fuel cost} \end{array}$$

c) electric:

$$\begin{array}{rcccl} \$ & \boxed{\phantom{000}} & / & \boxed{\phantom{000}} \text{ mi/kWh} & = & \$ \boxed{\phantom{000}} & 3c \\ & \$ \text{ per kWh} & & \text{vehicle miles per kWh} & & \$ \text{ per mile fuel cost} \end{array}$$

4) Then subtract the **\$ per mile fuel cost** of your alternative fuel from the **\$ per mile fuel cost** of gasoline to find your **\$ savings per mile**.

$$\begin{array}{rcccl} \$ & \boxed{.0667} & - & \$ \boxed{.0417} & = & \$ \boxed{.025} & 4a \\ & \$ \text{ per mile fuel cost gasoline (from box 3a)} & & \$ \text{ per mile fuel cost alternative fuel (from box 3b or 3c)} & & \$ \text{ savings per mile} \end{array}$$

5) Then divide the **Net Incremental Cost**, box 2a, by the **\$ savings per mile**, box 4a, to get the payback period for your AFV in terms of miles.

$$\begin{array}{rcccl} \$ & \boxed{971.50} & / & \$ \boxed{0.025} & = & \boxed{38,860} \text{ miles} \\ & \text{Net Incremental Cost (from box 2a)} & & \$ \text{ savings per mile (from box 4a)} & & \text{Payback in miles} \end{array}$$

\* NOTE: Fuel prices were collected in July 1995. Actual amount of tax deduction figure will vary with individual's/company's tax bracket.

# ALTERNATIVE FUEL VEHICLE INCENTIVES AND LAWS

## EXAMPLE 2

### AFV FUNDING WORKSHEET -- Kansas - Compressed Natural Gas Vehicle Conversion

#### PART 1 - Sources of Funding

- I. State Incentives  
50% tax credit for conversion cost (see page 58)  
Conversion cost = \$4,000; \$4,000 \* 0.50 = \$2,000  
\$1,500 from Kansas Corporation Commission (see page 58)  
\$2,000 + \$1,500 = \$3,500
- II. Utilities/Private Incentives
- III. State Laws & Regulations
- IV. Federal Tax Incentives  
IRS tax deduction 0.28 \* \$2,000 = \$560 (see page 128)  
(28% tax bracket)

#### Amount You Expect to Receive

\$ 3,500

+

+

+

560

Total Funding =

\$ 4,060

#### PART 2 - Payback Period

1) To calculate an AFV's payback period, you first need to know the **Incremental Cost** of that vehicle compared to a comparable gasoline vehicle:

$$\begin{array}{rcccl} \$ & \boxed{\phantom{000000}} & - \$ & \boxed{\phantom{000000}} & = \$ \boxed{4,000} & 1a \\ & \text{Initial Cost of AFV} & & \text{Cost of Comparable Gasoline Vehicle} & & \text{Incremental Cost *} \end{array}$$

\* NOTE: If you are converting existing fleet vehicles, then substitute the conversion cost for the **Incremental Cost**.

2) Subtract from the **Incremental Cost**, box 1a, the **Total Funding** from the box at the bottom of Part 1 to get the **Net Incremental Cost**.

$$\begin{array}{rcccl} \$ & \boxed{4,000} & - \$ & \boxed{4,060} & = \$ \boxed{-60^{**}} & 2a \\ & \text{Incremental Cost (from box 1a)} & & \text{Total Funding (from part 1)} & & \text{Net Incremental Cost} \end{array}$$

3) To find the **\$ per mile fuel cost**, divide your fuel cost per gasoline gallon equivalent (gge) by your vehicle's miles per gallon (mpg). Do this calculation for both gasoline and the alternative fuel.

a) gasoline:

$$\begin{array}{rcccl} \$ & \boxed{\phantom{000000}} & / & \boxed{\phantom{000000}} \text{ mpg} & = \$ \boxed{\phantom{000000}} & 3a \\ & \$ \text{ per gallon} & & \text{vehicle mpg} & & \$ \text{ per mile fuel cost} \end{array}$$

b) alternative fuel:

$$\begin{array}{rcccl} \$ & \boxed{\phantom{000000}} & / & \boxed{\phantom{000000}} \text{ mpg} & = \$ \boxed{\phantom{000000}} & 3b \\ & \$ \text{ per gge} & & \text{vehicle mpg} & & \$ \text{ per mile fuel cost} \end{array}$$

c) electric:

$$\begin{array}{rcccl} \$ & \boxed{\phantom{000000}} & / & \boxed{\phantom{000000}} \text{ mi/kWh} & = \$ \boxed{\phantom{000000}} & 3c \\ & \$ \text{ per kWh} & & \text{vehicle miles per kWh} & & \$ \text{ per mile fuel cost} \end{array}$$

4) Then subtract the **\$ per mile fuel cost** of your alternative fuel from the **\$ per mile fuel cost** of gasoline to find your **\$ savings per mile**.

$$\begin{array}{rcccl} \$ & \boxed{\phantom{000000}} & - \$ & \boxed{\phantom{000000}} & = \$ \boxed{\phantom{000000}} & 4a \\ & \$ \text{ per mile fuel cost gasoline (from box 3a)} & & \$ \text{ per mile fuel cost alternative fuel (from box 3b or 3c)} & & \$ \text{ savings per mile} \end{array}$$

5) Then divide the **Net Incremental Cost**, box 2a, by the **\$ savings per mile**, box 4a, to get the payback period for your AFV in terms of miles.

$$\begin{array}{rcccl} \$ & \boxed{\phantom{000000}} & / \$ & \boxed{\phantom{000000}} & = \boxed{\phantom{000000}} & \text{miles} \\ & \text{Net Incremental Cost (from box 2a)} & & \$ \text{ savings per mile (from box 4a)} & & \text{Payback in miles} \end{array}$$

\*\* We did not calculate the payback period because there was no additional cost to pay back.

# ALTERNATIVE FUEL VEHICLE INCENTIVES AND LAWS

## EXAMPLE 3

### AFV FUNDING WORKSHEET -- State of California - Electric Vehicle Purchase

#### PART 1 - Sources of Funding

- I. State Incentives  
South Coast Air Quality Management District  
\$5,000/Electric Vehicle (see page 20)  


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- II. Utilities/Private Incentives  


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- III. State Laws & Regulations  


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- IV. Federal Tax Incentives  
Federal tax credit for electric vehicle (see page 128)  
10 percent of vehicle cost up to \$4,000  
Vehicle cost = \$32,000 \* 0.10 = \$3,200  


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#### Amount You Expect to Receive

\$ 5,000

+ \$

+ \$

+ \$ 3,200

Total Funding = \$ 8,200

#### PART 2 - Payback Period

1) To calculate an AFV's payback period, you first need to know the **Incremental Cost** of that vehicle compared to a comparable gasoline vehicle:

$$\begin{array}{rcccl} \$ & \boxed{32,000} & - \$ & \boxed{20,000} & = \$ & \boxed{12,000} & 1a \\ & \text{Initial Cost of AFV} & & \text{Cost of Comparable Gasoline Vehicle} & & \text{Incremental Cost *} \end{array}$$

\* NOTE: If you are converting existing fleet vehicles, then substitute the conversion cost for the **Incremental Cost**.

2) Subtract from the **Incremental Cost**, box 1a, the **Total Funding** from the box at the bottom of Part 1 to get the **Net Incremental Cost**.

$$\begin{array}{rcccl} \$ & \boxed{12,000} & - \$ & \boxed{8,200} & = \$ & \boxed{3,800} & 2a \\ & \text{Incremental Cost (from box 1a)} & & \text{Total Funding (from part 1)} & & \text{Net Incremental Cost} \end{array}$$

3) To find the **\$ per mile fuel cost**, divide your fuel cost per gasoline gallon equivalent (gge) by your vehicle's miles per gallon (mpg). Do this calculation for both gasoline and the alternative fuel.

a) gasoline:

$$\begin{array}{rcccl} \$ & \boxed{1.20} & / & \boxed{20} & \text{mpg} & = & \$ & \boxed{0.06} & 3a \\ & \$ \text{ per gallon} & & \text{vehicle mpg} & & & \$ \text{ per mile fuel cost} \end{array}$$

b) alternative fuel:

$$\begin{array}{rcccl} \$ & \boxed{\phantom{0000}} & / & \boxed{\phantom{0000}} & \text{mpg} & = & \$ & \boxed{\phantom{0000}} & 3b \\ & \$ \text{ per gge} & & \text{vehicle mpg} & & & \$ \text{ per mile fuel cost} \end{array}$$

c) electric:

$$\begin{array}{rcccl} \$ & \boxed{0.041} & / & \boxed{4} & \text{mi/kWh} & = & \$ & \boxed{0.01025} & 3c \\ & \$ \text{ per kWh} & & \text{vehicle miles per kWh} & & & \$ \text{ per mile fuel cost} \end{array}$$

4) Then subtract the **\$ per mile fuel cost** of your alternative fuel from the **\$ per mile fuel cost** of gasoline to find your **\$ savings per mile**.

$$\begin{array}{rcccl} \$ & \boxed{.06} & - \$ & \boxed{0.01025} & = \$ & \boxed{0.04975} & 4a \\ & \$ \text{ per mile fuel cost gasoline (from box 3a)} & & \$ \text{ per mile fuel cost alternative fuel (from box 3b or 3c)} & & \$ \text{ savings per mile} \end{array}$$

5) Then divide the **Net Incremental Cost**, box 2a, by the **\$ savings per mile**, box 4a, to get the payback period for your AFV in terms of miles.

$$\begin{array}{rcccl} \$ & \boxed{3,800} & / \$ & \boxed{0.04975} & = & \boxed{76,381} & \text{miles} \\ & \text{Net Incremental Cost (from box 2a)} & & \$ \text{ savings per mile (from box 4a)} & & \text{Payback in miles} \end{array}$$

\* NOTE: Fuel prices were collected in July 1995.



### ***State Alternative Fuel Vehicle Incentives and Laws***

The information in this guide is current as of November 17, 1995. However, programs and laws are constantly changing, and although we did our best to keep up with these changes, this information will need to be updated on a continual basis. If your organization is not listed, or if the information on your organization's programs has changed, please call TG Powell, Clean Cities Consultant, Abacus Technology Corporation, at (301) 951-1717, and let us know so that corrections can be made in the next edition.